Geometry Notes

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MATH

Naming simple geometric figures

In this lesson we'll look at basic geometric figures like points, lines, line segments, rays, and angles, and we'll talk about how to name them.

Points

A point is a representation of a location in space. Its symbol is a single letter, and it's represented as a dot. Point A might look like this:

Lines

A line extends to infinity in two opposite directions, so it can be thought of as the straight path that connects two points (and extends past them). The symbol for a line is two letters that represent two points on the line, with a double arrowed line over them. A drawing of a line needs to be straight and have arrows on both ends. Line $\overleftrightarrow{AB}$ (also called line $\overleftrightarrow{BA}$), might look like this:

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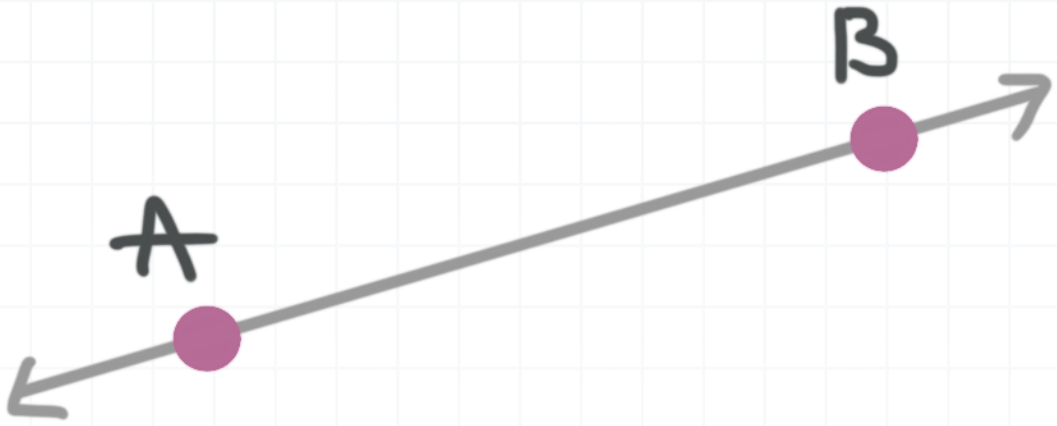

A line can also be named with a lowercase letter. Line p might look like this:

Line segments

A line segment is a piece of a line that connects two points. The points at the end of the line segment are called endpoints. You name a line segment by using its endpoints.

The symbol for a line segment is the letter name of each of the endpoints with a line over the top. A drawing of a line segment has two points at the ends.

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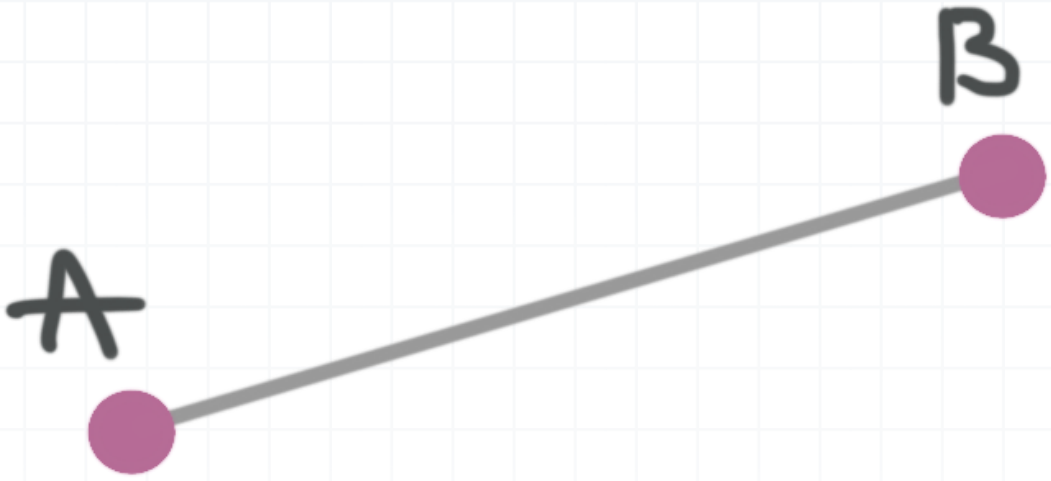
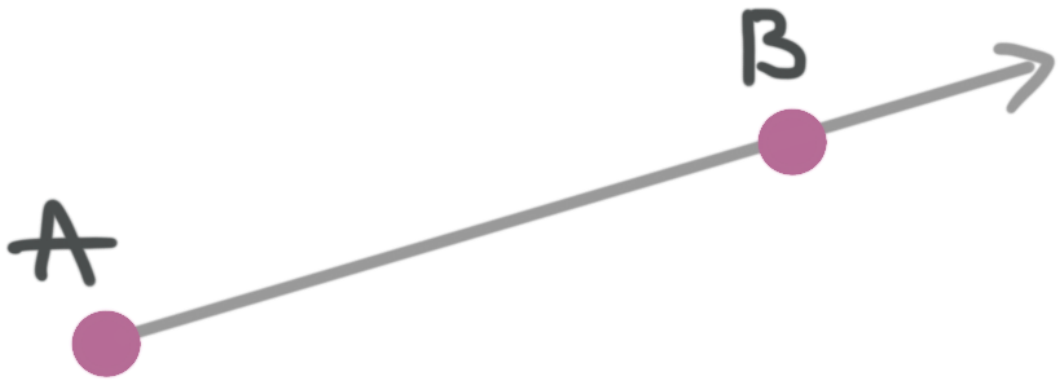


Rays

Another part of a line is called a ray. A ray is the part of line that has one endpoint and one side that goes on to infinity. You name a ray with the endpoint and any other point on the ray.

The symbol for a ray must include the endpoint which is usually written first, and another point on the ray. The two points will have a one-sided arrow over the top that points to the letter of the point on the "line" part of the ray. Ray $\overrightarrow{AB}$ might look like this:



Sometimes you can also name a ray with a lowercase letter. Ray l might look like this:

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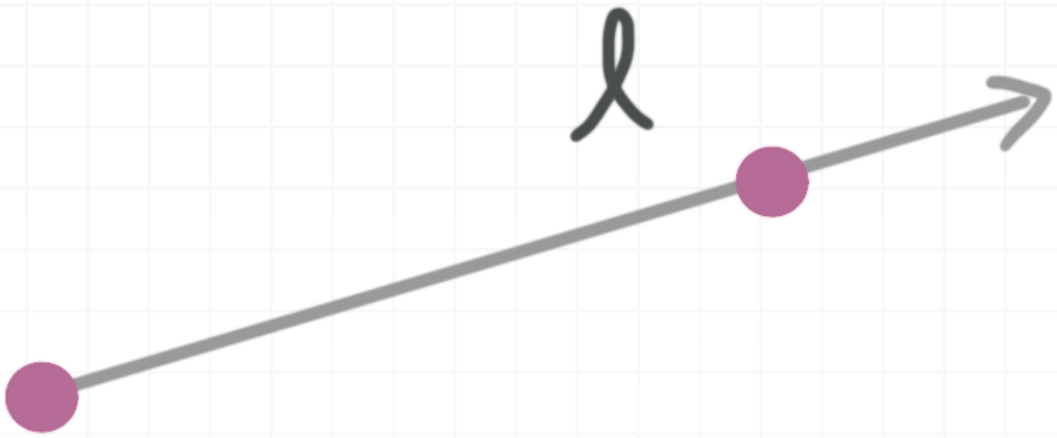

Angles

When two rays share a common endpoint, they form an angle. The common endpoint of the angle is called the vertex. These are ways to name angles:

1. Writing the angle shape and then the letter that corresponds to the vertex.
2. Writing the angle shape and then three letters: the point from the first ray, the point from the vertex, and the point from the last ray.
3. Writing the angle shape, the point from the last ray, the point from the endpoint, the point from the first ray.
4. You can also name an angle with a lowercase letter or number. If the lowercase letter or number is written inside of the angle, then you write the angle symbol and whatever name is inside of the angle.

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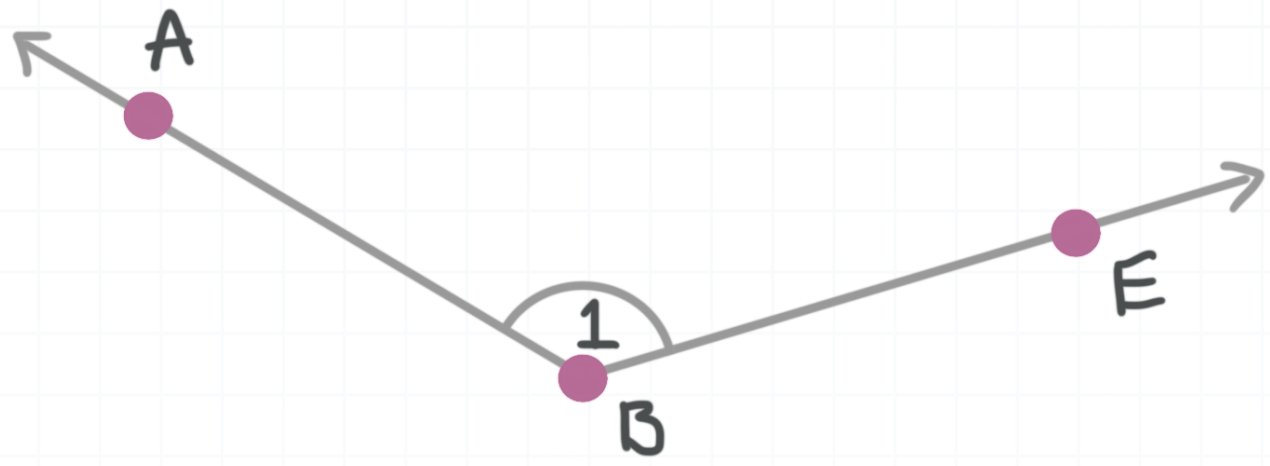
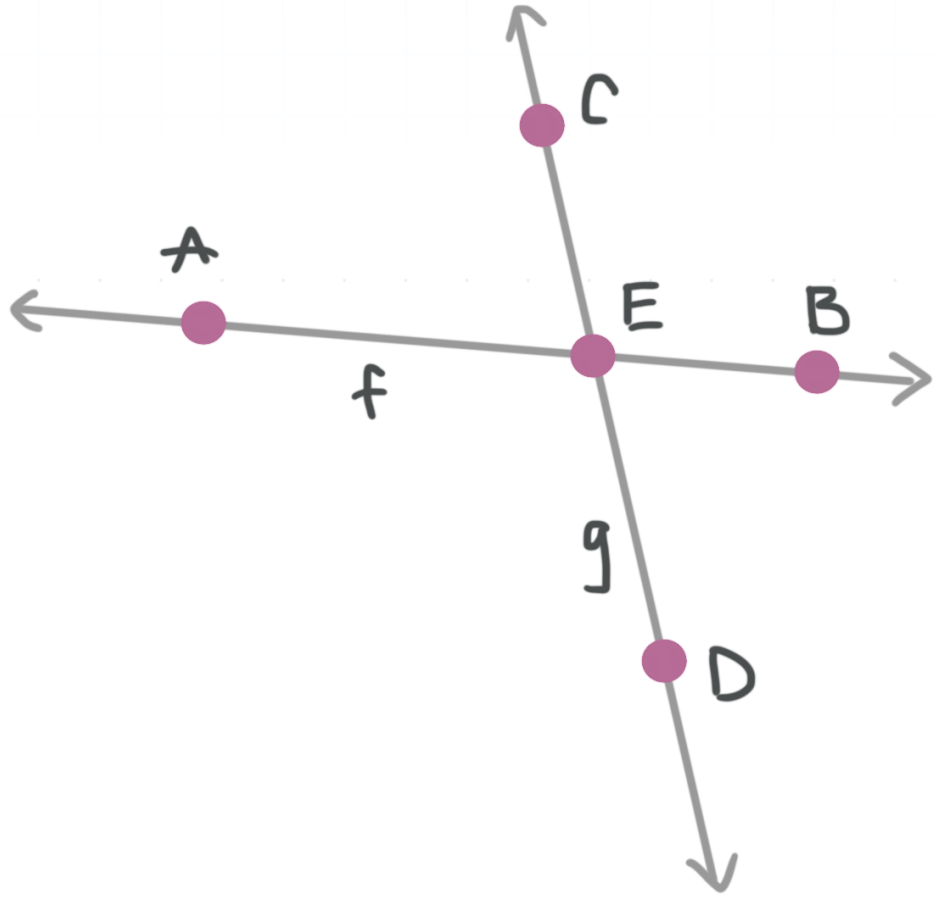
If you choose method 2 or 3, be sure to put the vertex in the middle of the name! Here is an angle named four different ways: Angle $\angle B$ or $\angle ABE$ or $\angle EBA$ or $\angle 1$.



Example

What does the letter f represent in the diagram?



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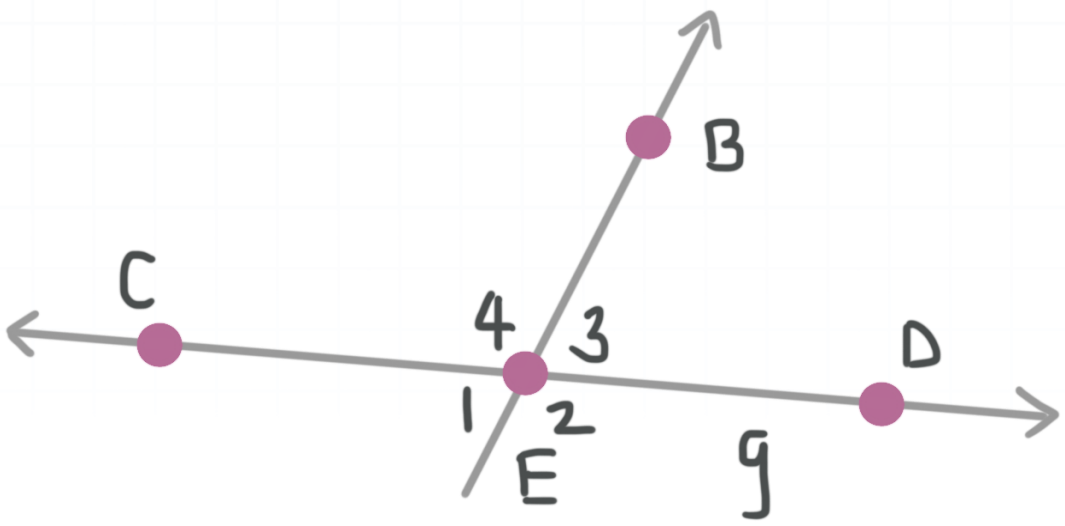
The letter f represents a line. The same line could also be called line $\overleftrightarrow{AB}$ or line $\overleftrightarrow{BA}$.

Let's look at naming angles.

Example

What are three other names for $\angle 4$? Are any of the names a bad choice? Why or why not?



E is the vertex of $\angle 4$, so it can be named $\angle E$, $\angle CEB$, or $\angle BEC$. In this case $\angle E$ would be a bad choice for the name because angles 1, 2, and 3 also share vertex E.

Let's try an example where we identify geometric figures by their written names.

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Example

Match the symbol on the left with the name of the figure on the right.

A	An angle
$\overrightarrow{AB}$	A point
$\overleftrightarrow{EF}$	A line
$\angle E$	A line segment
$\overline{JI}$	A ray

Remembering what each symbol represents can go a long way in helping you to solve and interpret geometry questions. We'll rearrange the column on the right so that each description corresponds to the correct symbol.

A	A point
$\overrightarrow{AB}$	A ray
$\overleftrightarrow{EF}$	A line
$\angle E$	An angle
$\overline{JI}$	A line segment

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